

PG&E Wave Energy Development

Federal Utility Partnership
Working Group Meeting

Ontario, CA
November 18-19, 2009

Wave Power.
Destroyer of rocks. Creator of clean energy.



Learn more about Wave Power at:

wecandothis.com



**Pacific Gas and
Electric Company®**

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Wave Power Overview

- What is Wave Power?
 - Wave power or wave energy is the energy contained in ocean waves that is converted into electricity by various means.
 - It is a clean, renewable energy resource capable of being utilized with a high, predictable capacity factor.
- Why Wave Power?
 - Wave power could make a significant contribution to California's renewable energy goals if the technology is proven to be economic and feasible.
- What is California's Potential?
 - PG&E service territory borders 600 miles of Pacific coastline.
 - Initial studies suggest that California's potential may exceed 37,000 MW (average, EPRI estimate). The California Energy Commission estimates the extractable electricity to be 7,500 MW.



Global Status of Wave Energy

Wave power technology is in the pre-commercial stage:

- Europe is in the lead:
 - Six demonstration projects in operation in Europe and Australia with a dozen more near commencement
 - UK Wave Hub is most like WaveConnect and will demonstrate four types of machines in 2009
- U.S. experience:
 - Hawaii – Ocean Power Technology, (OPT) (PowerBuoy™)
 - Wave project licensed (by US Navy) and installed in June 2005
 - Oregon – Also OPT (PowerBuoy™)
 - FERC preliminary permit
 - Preliminary Permits Issued
 - FERC has issued dozens of preliminary permits since 2007
 - PG&E was issued preliminary permits from FERC for its Humboldt site in March 2008



What is WaveConnect?

The PG&E WaveConnect program is a study of the feasibility of using ocean wave energy to provide renewable, carbon-free electricity generation to California.

WaveConnect initiated the licensing of a pilot project off the coast of Humboldt County in early 2008.

WaveConnect is engaged in a technical exchange with Vandenberg AFB considering the siting of a wave energy project offshore of the Base.

The WaveConnect project emboldens our Integrated Energy Management Plan with VAFB. An energy plan based on our loading order: Energy Efficiency / Demand Response / Renewable generation / Carbon Offset.

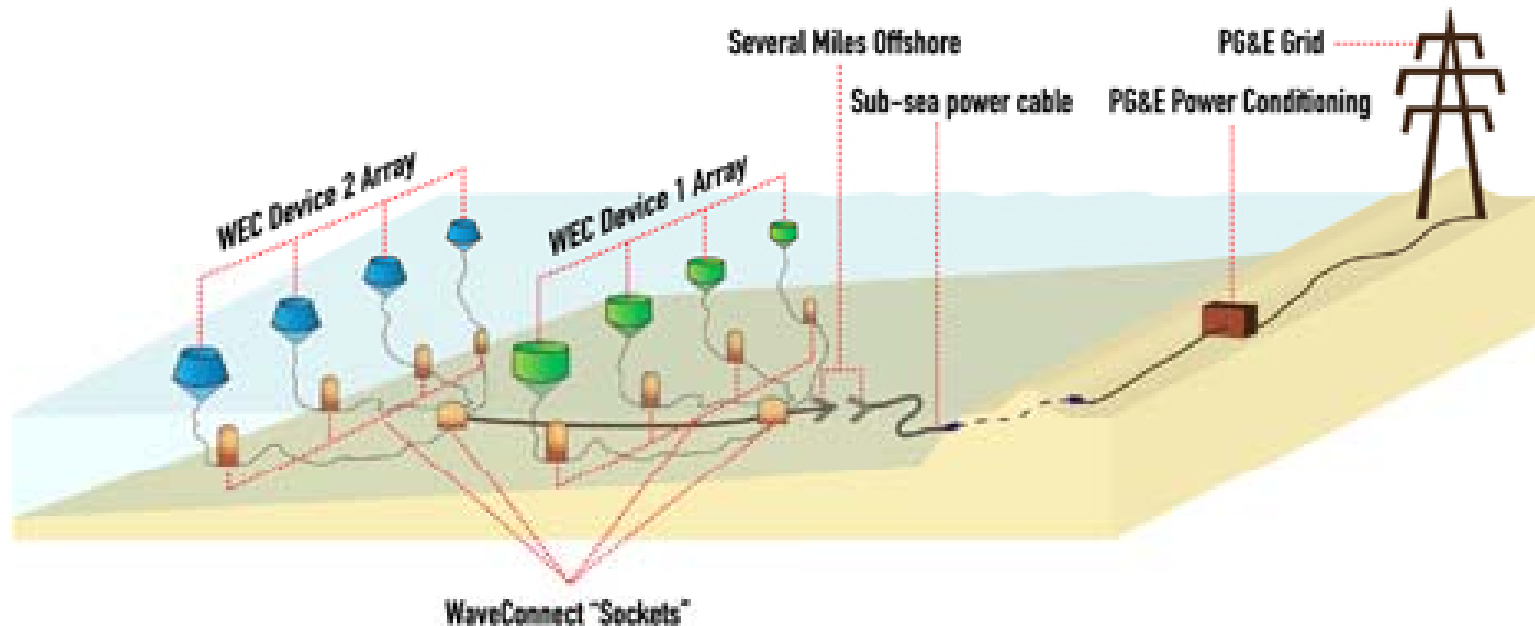


Humboldt Project History

- Granted FERC preliminary permit in March 2008
- Public Informational Forum in April 2008
- Received funding from DOE and CPUC in March 2009
- Public Involvement Meetings begun in May 2009
- Developing FERC Pilot License Application for submittal March 2010



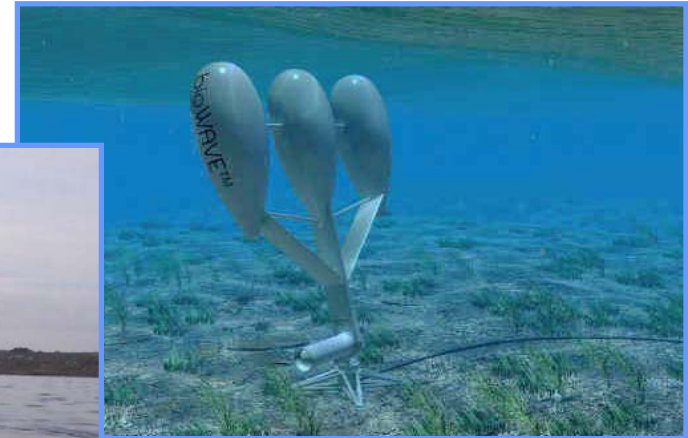
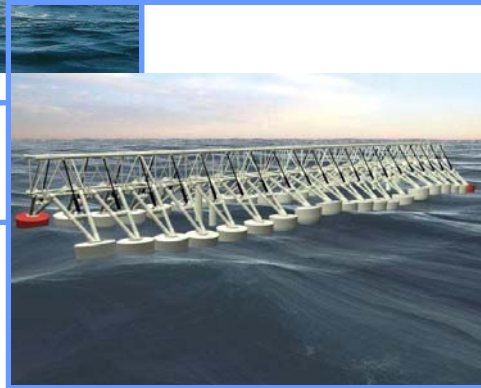
Humboldt Pilot Project



Wave energy conversion (WEC) devices convert the ocean's energy into electricity. The power is transmitted through an undersea cable to land, where the electricity is conditioned and fed to PG&E's electric grid.

Wave Energy Converters (WEC)

- A Request for Information (RFI) was broadly distributed to WEC manufacturers. PG&E plans to evaluate the responses and choose the devices that are best suited to the Humboldt site.



Want to Stay Informed?

Check out the WaveConnect Website

www.pge.com/waveconnect

- Sign-up to our contact list. PG&E will be sending updates around project milestones
- Communicate with the Project Team
- Review meeting presentations, summaries, and related materials

